



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/688,465	10/16/2000	Bernhard Schatzler	GR 97 P 1049 D	1415

7590

11/18/2002

Laurence A Greenberg
P O Box 2480
Hollywood, FL 33022

EXAMINER

PAREKH, NITIN

ART UNIT	PAPER NUMBER
----------	--------------

2811

DATE MAILED: 11/18/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.
09/688,465

Applicant(s)
Schatzler

Examiner
Nitin Parekh

Art Unit
2811



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Aug 27, 2002
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- *See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 3 and 1 6) ☐ Other:

Art Unit: 2811

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lim et al (US Pat. 5773878) in view of the admitted prior art (APA- Inaba, US Pat. 4258381).

Regarding claim 1, Lim et al disclose an electronic component comprising :

- a housing made of a casting/molding compound (24 in Fig. 2)
- an integrated circuit (IC) having base area (20 in Fig. 2)
- a lead frame (100 in Fig. 2) having an island/die pad with a continuous/unpatterned base area supporting the IC (14 in Fig. 2; Col. 1, line 33), the base area of the IC being smaller than that of the island, and
- the IC and the island being embedded in the housing so that a thickness of the housing region above the IC is substantially equal to that below the island (Fig. 2 and 4A; Col. 3, line 30) for avoiding deformation/flexure of the molding compound/casting (Fig. 1-4B; Col. 1, line 20- Col. 4, line 40).

Art Unit: 2811

Lim et al further disclose the island/die pad being square in shape (Col. 1, line 35) and disclose the ratio between the length/horizontal dimension of the IC and the island/die pad being 0.75 (as measured from the dimensions in Fig. 2) but fail to specify the ratio between the base area of the IC and that of the island/die pad being 0.7- 0.9 for avoiding the flexure of the housing.

The APA teaches using the IC and the island having conventional square shapes (Col. 4) and using a range of island dimensions to support various chip sizes (Col. 2, line 55). The APA further teaches selecting the dimensions of the island depending on the size of the IC and the respective area ratio to achieve the desired bonding strength, heat dissipation and mechanical strength for the island (Col. 2, line 55; Col. 5, line 1-25) including an area ratio between the IC and the island of 0.973 (Col. 4, line 45-58; page 4 of remarks/applicant's response in paper #10).

Furthermore, the determination/selection of the parameters such as the dimensions of the IC chip and die pad/island including width, thickness, shape, area/area ratio, clearance of the die from an edge of the die pad/leads, etc. are a matter of routine optimization to achieve the desired support/rigidity, resin flow and to reduce the stress/encapsulation related defects for the lead frame package.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time invention was made to select ratio between the base area of the IC and that of

Art Unit: 2811

mechanical strength/rigidity and the reliability can be improved using the APA's leadframe design in Lim et al's housing.

Regarding claim 2, Lim et al disclose an adhesive bonding of the IC to the island (Col. 2, line 9) and a hollow groove shape/fillet being formed by emerged adhesive at the notch/groove/overhang portion of the island (Fig. 2).

Regarding claim 3, the claim elements have been addressed in the rejection as explained above for claim 1

Regarding claim 4, Lim et al disclose the lead frame including the leads being conventionally bonded/routed to the island (Col. 2, line 11).

Regarding claim 5, Lim et al disclose the lead frame including the leads being vertically centered within the housing and the island being vertically lowered with respect to the leads (Fig. 2).

Response to Arguments

3. Applicant's arguments filed on 08-27-02 have been fully considered but they are not persuasive.

Art Unit: 2811

A. Applicant contends that none of the references teach using the ratio between the base area of the IC and that of the island being 0.7- 0.9 for avoiding the flexure of the housing.

As explained above, Lim et al in view of the APA teaches selecting the dimensions of the IC, island and the respective ratio to achieve the desired bonding strength, heat dissipation and mechanical strength for the island and the leadframe package (Inaba- Col. 2, line 55; Col. 5, line 1-25).

Furthermore, the determination/selection of parameters such as the dimensions of the IC chip and die pad/island including width, thickness, shape, area/area ratio, clearance of the die from an edge of the die pad/leads, etc. are a matter of routine optimization in the chip packaging art to achieve the desired support/rigidity, resin flow and to reduce the stress/encapsulation related defects for the lead frame package. Therefore, it would have been obvious to one of ordinary skill in the art at the time invention was made to arrive at a ratio of 0.7- 0.9 between the base area of the IC and the island to reduce the stress and avoid the flexure of the housing.

Papers related to this application may be submitted directly to Art Unit 2811 by facsimile transmission. Papers should be faxed to Art Unit via Technology Center 2800 fax center located in Crystal Plaza 4, room 4C23. The faxing of such papers must

Art Unit: 2811

Response to Arguments

3. Applicant's arguments filed on 08-27-02 have been fully considered but they are not persuasive.

A. Applicant contends that none of the references teach using the ratio between the base area of the IC and that of the island being 0.7- 0.9 for avoiding the flexure of the housing.

As explained above, Lim et al in view of the APA teaches selecting the dimensions of the IC, island and the respective ratio to achieve the desired bonding strength, heat dissipation and mechanical strength for the island and the leadframe package (Inaba- Col. 2, line 55; Col. 5, line 1-25).

Furthermore, the determination/selection of parameters such as the dimensions of the IC chip and die pad/island including width, thickness, shape, area/area ratio, clearance of the die from an edge of the die pad/leads, etc. are a matter of routine optimization in the chip packaging art to achieve the desired support/rigidity, resin flow and to reduce the stress/encapsulation related defects for the lead frame package. Therefore, it would have been obvious to one of ordinary skill in the art at the time invention was made to arrive at a ratio of 0.7- 0.9 between the base area of the IC and the island to reduce the stress and avoid the flexure of the housing.

Art Unit: 2811

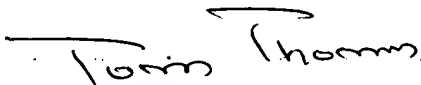
Papers related to this application may be submitted directly to Art Unit 2811 by facsimile transmission. Papers should be faxed to Art Unit via Technology Center 2800 fax center located in Crystal Plaza 4, room 4C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nitin Parekh whose telephone number is (703) 305-3410. The examiner can be normally reached on Monday-Friday from 08:30 am-5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas, can be reached on (703) 308-2772. The fax number for the organization where this application or proceeding is assigned is (703) 308-7722 or 7724.

Nitin Parekh

11-13-02


TOM THOMAS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800